REMARKS

The above amendments are made in response to the final Office Action mailed September 8, 2003, wherein Claims 31-35, 39-72 and 73-80 were rejected as being obvious over U.S. Patent No. 5,189,679 to Derry, *et al.* (the "Derry patent"). Applicants respectfully traverse the rejections for the reasons provided below. **Claims 31-35 and 39-80 are pending.**

General Comments

As its *primary* objective, the Derry patent seeks to select the values of certain elements of a semiconductor laser in order to *minimize the temperature dependence* of certain laser parameters, in the belief that such minimization will increase the operating lifetime of the device (Derry patent, column 1, line 46 through column 2, line 4; column 2, lines 42-47). In contrast to the Derry patent, the present invention seeks to *minimize the power consumption* of a semiconductor laser device for a given optical output power, or equivalently *maximize the device's photo-electric conversion efficiency*, by the selection of the values of certain laser elements. In preferred embodiments of the present invention, these element values are the laser cavity length L and/or carrier concentration of the upper cladding layer, and the device's power consumption is vicinal to a minimum value for the given optical output power (or equivalently, the device's photo-electric power conversion efficiency is vicinal to a maximum value for the given optical output power). These objectives of the present invention are very different from the primary objective of the Derry patent, and lead to different selections of element values.

The Derry patent generally teaches that the *temperature dependence* of its laser device is minimize by selecting high values for both of the front and rear facet reflectivities, and selecting cavity lengths in the range of 500 μm to 800 μm (Derry patent column 1, lines 66-68 and column 5, lines 1-68). However, the Derry patent notes that the selection of a high value for the front facet reflectivity (R_F) reduces the amount of light available at the device's output (column 5, lines 12-15), and reduces the device's normalized quantum efficiency, as illustrated in Derry's FIG. 6 (Derry patent, column 6, lines 38-60). Thus, Derry's primary objective of reducing the laser's temperature sensitivity conflicts with increasing the laser's optical output power. To address this conflict, the Derry patent states that the cavity length can be increased somewhat as a compromise to compensate for the problems caused by lowering the front facet reflectivity,

which the Rejection has noted. However, the Derry patent also states that increasing the cavity length causes the device's threshold current to increase (Derry patent, column 6, lines 1-3), which in turn increases undesirable heating in the device. Given these two conflicts, the Derry patent advises one of ordinary skill in the art that "[i]n general, it is desirable to have low threshold current density, with as short a laser cavity as possible, to minimize threshold current and the electric power consumption" (Derry patent, column 5, lines 66, *et seq*, emphasis added). Further to this, the Derry patent gives the following *specific* directions to one of ordinary skill in the art:

1. "[b]y extrapolation between curves 113 and 114 [of FIG. 6], it may be seen that a high quantum efficiency, high temperature device can be obtained, for front facet reflectivities of up to 60%, by making the cavity length L equal to or larger than about 600 microns" (Derry patent, column 6, lines 60-65).
2. "Conversely, *a device specifically designed for low electrical power consumption* at high temperature can be obtained by using a front face reflectivity *of at least 60%*, and a cavity length L *less than 600 microns*" (emphasis added, Derry patent, column 6, lines 65-68).

The above second direction of the Derry patent leads one of ordinary skill in the art to the conclusion that increasing cavity length beyond 600 μm while reducing the front facet reflectivity to values below 60% will increase power consumption. Derry's second direction is contrary to many of the rejected independent claims (which seek to reduce power consumption), which recite a front facet reflectivity of less than approximately 4% and/or cavity lengths of approximately 1000 μm or more.

As a further difference, the Derry patent does not teach or suggest semiconductor lasers that output more than 15 mW of optical output power (Derry patent, FIGS. 8A, 8B, and 10, and column 8, line 15), whereas many of the rejected independent claims recite levels of at least approximately 50 mW, which is more than 3 times higher. Derry's primary objective of minimizing temperature dependencies of the laser device causes the front facet reflectivity to be high, which in turn causes the optical output power to be low. Derry's primary objective, therefore, constrains the optical output power of his devices to be low. Therefore, any suggestion to triple or quadruple Derry's optical output power levels, in order to reach the minimum levels recited by many of the rejected claims, would be contrary to achieving Derry's

primary objective. More importantly, as indicated at column 1, lines 12-26, the Derry patent is directed to constructing lasers for use in high-temperature military and aerospace applications where reliable cooling means are not available. High optical output power would be incompatible within this application environment since high optical output power requires high power dissipation in the laser, and since such high-power dissipation without cooling means would dramatically increase the laser's operating temperature, if not lead to the destruction of the device. Thus, any suggestion to modify the Derry patent to triple or quadruple the optical output power level, in order to reach the minimum levels recited by many of the rejected claims, would not be obvious.

The Rejection has relied upon the case of *In Re Boesch* to argue that certain modifications to Derry's optical output power, cavity length, and front facet reflectivity would be obvious to make in order to meet certain limitations of the rejected claims. However, such broad modifications cannot be advanced when they are taught against by the reference itself, or when they take the construction of the reference's device well outside the bounds fairly considered by the reference. As to optical output power, Derry's maximum value would have to be more than tripled in order to meet the minimum value recited by many of the claims, and such tripling of the power would take the device outside of the design bounds of the Derry patent for the reasons indicated above (*i.e.*, the device would not be suitable for high-temperature environments where there is no cooling means). In the *In re Boesch* case, the claimed value ranges and the prior art value ranges were overlapping. In the case at hand, there is a wide separation by at least a factor of three between the claimed optical output power range and the prior art range. As to cavity length, the relevant rejected claims recite the combination of an electric power consumption vicinal near a minimum and a cavity length greater than 1000 μm. Derry's closest combination to this is a combination of reduced power consumption and cavity lengths less than 600 microns, which is *opposite* to that recited by the rejected claims. Because Derry expressly teaches the opposite combination and teaches against the relevant rejected claims, the *In re Boesch* case cannot be used to modify the Derry patent to meet the limitations of the rejected claims. Finally, in a following section below, Applicants rebut the reliance on the *In re Boesch* case for modifying the front facet reflectivity for the specific claims to which is the issue is relevant.

Response to the Rejection of Independent Claim 31 and its Dependent Claim 32 and 74

Claim 31 recites at least two steps that are not taught or suggested by the Derry patent. First, claim 31 recites a step of "acquiring a relationship of the electric drive power as a function of the cavity length and the optical output power level of the semiconductor laser apparatus, the relationship including cavity lengths greater than 1000 μm and optical output power levels greater than 50 mW." The Derry patent does not teach or suggest acquiring any relationship of the electric drive power as a function of cavity length and/or optical output power. The Derry patent discloses the following relationships: (1) threshold gain in its FIG. 4 as a function of threshold current density and temperature, (2) threshold current density in its FIGS. 5A-5D as a function of cavity length and facet reflectivities, (3) normalized quantum efficiency in its FIG. 6 as a function of cavity length, (4) threshold gain in its FIG. 7 as a function of threshold current density, temperature, and indium fraction in the well layer, (5) optical output power "*L(mW)*" in its FIGS. 8A-8B and 10 as a function of diode current I(mA) and temperature, (6) normalized threshold current in its FIG. 9 as a function of temperature and cavity length, and (7) diode current in its FIGS. 11-13 as a function of hours of operating time and temperature. None of Derry's relationships involve *electric drive power*. Moreover, there is nothing in the Derry patent that teaches how one might cobble together the relationship acquired by claim 31 from those relationships disclosed by Derry, if at all possible. And since the court's holding in *In re Boesch* pertained to the selection of parameter values and not to the creation of relationships or method steps, *In re Boesch* cannot be used to cobble together the relationship acquired by claim 31 from those relationships disclosed by Derry. Accordingly, Applicants respectfully submit the Derry patent does not teach or suggest the recited step of "acquiring a relationship of the electric drive power as a function of the cavity length and the optical output power level of the semiconductor laser apparatus," and for this reason the Derry patent does not teach or suggest claim 31.

Moreover, all the data collected by the Derry patent pertains to laser's which emit less than 15 mW of optical output power (Derry patent, FIGS. 8A, 8B, and 10, and column 8, line 15), whereas the relationship acquired by this step of claim 31 includes power levels *above 50 mW*, more than three times higher than Derry. As indicated in Applicants' general comments above, it would not be obvious to modify Derry's device to triple the optical output since such

action would be contrary to Derry's primary objective of minimizing temperature dependencies, and would lead to devices that were incompatible with Derry's application environment (high temperature, no cooling means). Furthermore, for the reasons indicated in the above general comments, the *In re Boesch* case cannot be used to argue that tripling or quadrupling the optical output power would be obvious.

As another difference, claim 31 recites a second step of "determining a value of the cavity length from the acquired relationship such that the electric drive power is vicinal to a minimum for the desired optical output power level and such that the value of cavity length is greater than 1000 μm, the desired optical power level being greater than 50 mW." The Derry patent does not teach or suggest any step of determining a value of the cavity length such that the electric drive power is *vicinal to a minimum for the desired optical output power level*. The Derry patent teaches selecting element values of the laser device such that the temperature dependencies of certain laser parameters are minimized. When the Derry patent does give consideration to power consumption, that consideration is secondary to the patent's primary objective of minimizing temperature dependencies, and that consideration leads to selecting cavity lengths that are *less than 600 μm* (Derry patent, column 6, lines 65-68), which is different and opposite to the recitation in claim 31 of "*greater than 1000 μm.*" Furthermore, because the Derry patent expressly teaches selecting a cavity length less than 600 μm when seeking to reduce power consumption, the *In re Boesch* case cannot be used to argue that opposite action recited by claim 31 (that of determining a value of cavity length greater than 1000 μm to reduce electric power consumption) would be obvious. For the above reasons, Applicants respectfully submit that the Derry patent itself teaches against this step of claim 31, and therefore that claim 31 is non-obvious over the Derry patent.

For the above reasons, Applicants respectfully submit that claim 31 is not obvious over the Derry patent. In addition, since each of dependent claims 32 and 74 includes the distinguishing features of claim 31, Applicants submit that tehse claims are not obvious as well.

Response to the Rejection of Independent Claim 33 and its Dependent Claims 34-35 and 75

Claim 33 recites at least two steps that are not taught or suggested by the Derry patent. First, claim 33 recites a step of "acquiring a relationship of the photoelectric conversion efficiency as a function of the cavity length and the optical output power level of the

semiconductor laser apparatus, the relationship including cavity lengths greater than 1000 μm and optical output power levels greater than 50 mW." The Derry patent does not teach or suggest acquiring any relationship of the photoelectric conversion efficiency as a function of cavity length and/or optical output power. As indicated at page 3, lines 21-22 of the Present Specification, the photoelectric conversion efficiency is the energy conversion efficiency of electrical power to optical power. Applicants have listed the relationships disclosed by the Derry patent in Applicants' above response to the rejection of claim 31, and Applicants respectfully submit that none of Derry's relationships involve photoelectric conversion efficiency. Moreover, there is nothing in the Derry patent that teaches how one might cobble together the relationship acquired by claim 33 from those relationships disclosed by Derry, if at all possible. And since the court's holding in *In re Boesch* pertained to the selection of parameter values and not to the creation of relationships or method steps, *In re Boesch* cannot be used to cobble together the relationship acquired by claim 33 from those relationships disclosed by Derry. Accordingly, Applicants respectfully submit the Derry patent does not teach or suggest the recited step of "acquiring a relationship of the photoelectric conversion efficiency as a function of the cavity length and the optical output power level of the semiconductor laser apparatus," and for this reason the Derry patent does not teach or suggest Claim 33.

Moreover, the relationship acquired by this step of claim 33 includes power levels above 50 mW, which are more than three-times greater that the maximum power level of 15 mW disclosed by the Derry patent. As indicated in Applicants' general comments above, it would not be obvious to modify Derry's device to triple the optical output since such action would be contrary to Derry's primary objective of minimizing temperature dependencies, and would lead to devices that were incompatible with Derry's application environment (high temperature, no cooling means). Furthermore, for the reasons indicated in the above general comments, the *In re Boesch* case cannot be used to argue that tripling or quadrupling the optical output power would be obvious.

As another difference, claim 33 recites a second step of "determining a value of the cavity length from the acquired relationship such that the photoelectric conversion efficiency is vicinal to a maximum for the desired optical output power level and such that the value of the cavity length is greater than 1000 μm, the desired optical power level being greater than

50 mW." The Derry patent does not teach or suggest any step of determining a value of the cavity length such that the photoelectric conversion efficiency is *vicinal to a maximum for the desired optical output power level.* The Derry patent teaches selecting element values of the laser device such that the temperature dependencies of certain laser parameters are minimized. When the Derry patent does give consideration to power consumption, which is inversely related to photoelectric conversion efficiency, that consideration is secondary to Derry's primary objective of minimizing temperature dependencies, and that consideration leads to selecting cavity lengths that are *less than 600 μm* (Derry patent, column 6, lines 65-68), which is different and opposite to the recitation in claim 33 of "*greater than 1000 μm.*" For this reason, Applicants respectfully submit that the Derry patent itself teaches against this step of claim 33, and therefore that claim 33 is non-obvious over the Derry patent. Also for this reason, the *In re Boesch* case cannot be relied upon.

For the above reasons, Applicants respectfully submit that claim 33 is not obvious over the Derry patent. In addition, since each of claims 34, 35, and 75 includes the distinguishing features of claim 33, Applicants submit that claims 34, 35, and 75 are not obvious over the Derry patent. In addition, claim 34 recites the following step which is not taught or suggested by the Derry patent: "obtaining, from the relationship acquired from step (a), an expression between cavity length and optical output power which describes combinations of cavity lengths and optical output power levels that make the photoelectric conversion efficiency maximal."

Response to the Rejection of Independent Claim 39 and its Dependent Claims 40, 73, & 76

Claim 39 recites at least two steps that are not taught or suggested by the Derry patent. First, claim 39 recites a step of "acquiring a relationship of the electric drive power as a function of the impurity carrier concentration of the upper cladding layer and the optical output power level of the semiconductor laser apparatus" (emphasis added). The Derry patent does not teach or suggest acquiring any relationship involving the impurity carrier concentration of the upper cladding layer. Applicants have listed the relationships disclosed by the Derry patent in Applicants' above response to the rejection of claim 31, and none of those relationships involve the impurity carrier concentration of the upper cladding layer. In fact, the Derry patent is completely silent about the impurity carrier concentration of its upper cladding layer. Accordingly, Applicants respectfully submit that the Derry patent does not teach or suggest the

recited step of "acquiring a relationship of the electric drive power as a function of the impurity carrier concentration of the upper cladding layer and the optical output power level of the semiconductor laser apparatus," and for this reason the Derry patent does not teach or suggest Claim 39. And since the court's holding in *In re Boesch* pertained to the selection of parameter values and not to the creation of relationships or method steps, *In re Boesch* cannot be used to cobble together the relationship acquired by claim 39 from those relationships disclosed by Derry. In addition, the Derry patent does not even teach the impurity carrier concentration of its upper cladding layer as being a variable, let alone a result-effective variable.

Claim 39 recites a second step of "determining a value of the impurity carrier concentration from the acquired relationship such that the electric drive power is vicinal to a minimum for the desired optical output power level." The Derry patent does not teach or suggest any step of determining a value of the impurity carrier concentration such that the electric drive power is *vicinal to a minimum for the desired optical output power level.* The Derry patent teaches selecting element values of the laser device such that the temperature dependencies of certain laser parameters are minimized. When the Derry patent does give consideration to power consumption, that consideration is secondary to the patent's primary objective of minimizing temperature dependencies, and that consideration leads to selecting element values that are not related to the impurity carrier concentration of the upper cladding layer. For this reason, Applicants respectfully submit that the Derry patent does not teach or suggest claim 39, and therefore that claim 39 is non-obvious over the Derry patent. And since the Derry patent does not even teach the impurity carrier concentration of its upper cladding layer as being a variable, let alone a result effective variable, the *In re Boesch* case cannot be used.

For the above reasons, Applicants respectfully submit that claim 39 is not obvious over the Derry patent. In addition, since each of dependent claims 40, 73 and 76 includes the distinguishing features of claim 39, Applicants respectfully submit that claims 40, 73, and 76 are not obvious over the Derry patent.

Response to the Rejection of Independent Claims 41 and 49 and their dependent claims

Independent Claim 41 recites a semiconductor laser device having a cavity length L in the range of approximately 1000 μm to approximately 1800 μm, a front facet reflectivity of less than approximately 4%, and electrodes driven by a power supply that cause the semiconductor

laser to operate with an optical output power level P_{OUT} that is maintained within a range that is less than or equal to a specified upper bound and greater than or equal to a specified lower bound. These specified upper and lower bounds are based on the cavity length L, and are selected to match the power level to the cavity length in order to seek an electric drive power that is vicinal to a minimum value (Present Specification, page 34, line 8 through to page 39, line 19). In a related manner, independent claim 49 recites a semiconductor laser device having a cavity length L in the range of approximately 1000 μm to approximately 1800 μm, a front facet reflectivity of less than approximately 4%, and an optical output power level P_{OUT} that is maintained within a range that is less than or equal to a specified upper bound and greater than or equal to a specified lower bound. These specified upper and lower bounds are based on the cavity length L in the same manner as independent claim 41, and are selected to match the power level to the cavity length in order to seek an electric drive power that is vicinal to a minimum value. The specific upper and lower bounds are illustrated in FIG. 16 of the present application.

The Derry patent does not anticipate the upper and lower bounds on the optical output power level P_{OUT} recited by independent claims 41 and 49 because the Derry patent does not disclose any optical output power level within the upper and lower bounds. In fact, the maximum optical output power disclosed by Derry is less than the lowest recited lower bound by more than a factor of 3. Moreover, the Derry patent does not make the upper and lower bounds on the optical output power level P_{OUT} obvious for the reasons provided above in Applicants' general comments. Specifically, Derry's primary objective of minimizing temperature dependencies constrains the optical output power of his devices, and high optical output devices are not compatible with Derry's application environment (high temperature, no cooling means). Additionally, for the reasons indicated in the above general comments, the *In re Boesch* case cannot be used to argue that tripling or quadrupling the optical output power would be obvious.

Moreover, the Derry patent directs one of ordinary skill in the art to use cavity lengths of 600 µm or less when seeking to lower power consumption (Derry patent, column 6, lines 65-68). This teaching of the Derry patent is contrary to the cavity lengths of 1000 µm to 1800 µm recited by the bodies of claims 41 and 49, which are for the purpose of reducing power consumption. For this reason, Applicants respectfully submit that claims 41 and 49 are not obvious over the Derry patent because the Derry patent directly teaches against claims 41 and 49.

Furthermore, the Derry patent does not anticipate or make obvious "the low reflectance coating disposed on the front facet having a reflectivity of less than approximately 4%" recited by independent claims 41 and 49. The Rejection of the claims acknowledges that the Derry patent does not teach front facet reflectivities of less than 5%. Nonetheless, the Rejection has pointed to column 6, lines 15-32 of the Derry patent and to the holdings of *In re Boesch* to support the proposition that it would be obvious to use reflectivities of less than approximately 4% in Derry's laser devices. However, a fair reading of the Derry patent leads one of ordinary skill in the art to view 5% as being Derry's lowermost limit on the front facet reflectivity. The discussion at column 5 of the Derry patent indicates that front facet reflectivities in the range of 32% to 90% (FIGS. 5B and 5C) give the best reduction in temperature sensitivities, which is Derry's primary objective. Furthermore, the discussion at column 6, lines 60-68 of the Derry patent indicates that the value of 60% for the front facet reflectivity is key dividing point for his laser design. Thus, one of ordinary skill in the art would view the normal working range for Derry's front facet reflectivity as being 32% to 90%, with the value of 5% being the lowermost value considered acceptable by Derry, and the lowermost value practical for achieving Derry's primary objective. (The discussion at column 6, lines 15-32 of the Derry patent is consistent with this view since most of this discussion is a relative comparison of a device using 90% for front facet reflectivity and a device using 32%.) Using *In re Boesch* to lower Derry's front facet reflectivity to values of less than approximately 4% would prevent Derry from achieving his primary objective, and for that reason *In re Boesch* cannot be used to argue that it would be obvious to modify the Derry patent to meet the limitations of claims 41 and 49. Finally, considering that the objective of the present invention is to reduce power consumption, the Derry patent expressly teaches increasing the front facet reflectivity to a value of 60% or more to reduce power consumption, which is directly opposite to the argument of lowering the front facet reflectivity proffered by the Rejection. For these reasons, Applicants respectfully submit that independent claims 41 and 49 are non-obvious over the Derry patent.

For the above reasons, Applicants respectfully submit that independent claims 41 and 49 are not obvious over the Derry patent. In addition, since each of dependent claims 42-48, 50-56, and 77-78 includes the distinguishing features of either of independent claims 41 and 49, Applicants submit that claims 42-48, 50-56, and 77-78 are not obvious over the Derry patent.

Response to the Rejection of Independent Claim 57 and its dependent claims 58-64 and 79

Independent Claim 57 recites a method of increasing the photoelectric conversion efficiency of a semiconductor laser, the laser having, *inter alia*, a cavity length L in the range of approximately 1000 μm to approximately 1800 μm, and a front facet reflectivity of less than approximately 4%. The method recites operating the semiconductor laser at an optical output power level P_{OUT} which is less than or equal to a specified upper bound and greater than or equal to a specified lower botund. These specified upper and lower bounds are based on the cavity length L, and are selected to match the power level to the cavity length in order to seek an electric drive power that is vicinal to a minimum value (Present Specification, page 34, line 8 through to page 39, line 19). The specific upper and lower bounds are illustrated in FIG. 16 of the present application.

The Derry patent does not anticipate operating the semiconductor laser's optical output power level P_{OUT} within the upper and lower bounds recited by independent claim 57 because the Derry patent does not disclose any optical output power level within the upper and lower bounds (in fact, the lower bound recited by claim 57 is more than three times higher than the maximum optical output power disclosed by the Derry patent). Moreover, the Derry patent does not make the upper and lower bounds on the optical output power level P_{OUT} obvious for the reasons provided above in Applicants' general comments. Also, for the reasons indicated in the above general comments, the *In re Boesch* case cannot be used to argue that tripling or quadrupling the optical output power would be obvious. For this reason, Applicants respectfully submit that independent claim 57 is non-obvious over the Derry patent.

Moreover, the Derry patent directs one of ordinary skill in the art to use cavity lengths of 600 μm or less when seeking to lower power consumption (and thus high photoelectric conversion efficiency) (Derry patent, column 6, lines 65-68). This teaching of the Derry patent is contrary to the cavity lengths of 1000 μm to 1800 μm recited by the body of claim 57, which are for the purpose of increasing photoelectric conversion efficiency, thereby reducing power consumption. Because Derry expressly teaches against claim 57, the *In re Boesch* case cannot be used to modify the Derry patent to meet the limitations of the rejected claims. Applicants therefore respectfully submit that claim 57 is not obvious over the Derry patent because the Derry patent directly teaches against claim 57.

For the above reasons, Applicants respectfully submit that independent claim 57 is not obvious over the Derry patent. In addition, since each of dependent claims 58-64 and 79 includes the distinguishing features of independent claims 57, Applicants respectfully submit that claims 58-64 and 79 are not obvious over the Derry patent.

Response to the Rejection of Independent Claim 65 and its Dependent Claims 66-72 and 80

Independent Claim 65 recites a method of forming a semiconductor laser to provide reduced power consumption or increased photoelectric conversion efficiency for a selected output power level P_{OUT} in the range between approximately 50 mW and approximately 400 mW, the laser having, *inter alia*, a front facet reflectivity of less than approximately 4% and a rear facet reflectivity of more than approximately 80%. The method recites selecting the cavity length of the laser to be within one of five ranges depending upon the selected output power level P_{OUT}. The first of the five ranges starts at approximately 1000 μm, and each of the remaining four ranges is above 1000 μm. In all cases, the selected output power level P_{OUT} is above approximately 50 mW. The claim recites a combination of the ranges of cavity-lengths and ranges of optical output power level, and these combinations seek an electric drive power that is vicinal to a minimum value (Present Specification, page 34, line 8 through to page 39, line 19).

For the reasons provided in Applicants' above general remarks, the Derry patent does not teach, suggest, or make obvious operating the semiconductor laser's optical output power level P_{OUT} at a level above approximately 50 mW. As stated above, the lower power level (approximately 50 mW) recited by claim 65 is more than three times higher than the maximum optical output power disclosed by the Derry patent. Also, for the reasons indicated in the above general comments, the *In re Boesch* case cannot be used to argue that tripling or quadrupling the optical output power would be obvious. For these reasons, the Derry patent does not teach, suggest, or make obvious the combinations of length ranges and power-level ranges recited by claim 65. Accordingly, Applicants respectfully submit that independent claim 65 is non-obvious over the Derry patent.

Moreover, the Derry patent directs one of ordinary skill in the art to use cavity lengths of 600 μm *or less* when seeking to lower power consumption (and thus high photoelectric conversion efficiency) (Derry patent, column 6, lines 65-68). This teaching of the Derry patent

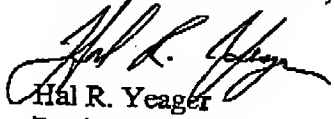
is contrary to the cavity-length ranges recited by claim 65 since each range starts at or above approximately 1000 μm. Because Derry expressly teaches against claim 65, the *In re Boesch* case cannot be used to modify the Derry patent to meet the limitations of the rejected claims. Applicants respectfully submit that claim 65 is not obvious over the Derry patent because the Derry patent directly teaches against claim 65.

For the above reasons, Applicants respectfully submit that independent claim 65 is not obvious over the Derry patent. In addition, since each of dependent claims 66-72 and 80 includes the distinguishing features of independent claims 65, Applicants respectfully submit that claims 66-72 and 80 are not obvious over the Derry patent.

CONCLUSION

In view of the remarks made above, Applicants respectfully submit that the application is in condition for allowance and action to that end is respectfully solicited. If the Examiner should have any questions or feel that a telephone interview would be productive in resolving issues in the case, he is invited to telephone the undersigned at the number listed below.

Respectfully submitted,



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